

88/1 (Msc) PUBL

359/447

# THE AMERICAN

MONTHLY

## MICROSCOPICAL JOURNAL.

VOL. V.

WASHINGTON, D. C., DECEMBER, 1884.

No. 12.

### Schröder's Camera Lucida.

Although mention has several times been made of this instrument in these pages, we have not yet described the precise construction of the prism. It is figured in the cut (Fig. 29), which shows the course of the rays of light and the angle at which they enter the prism from the paper.

The eye is supposed to be located at  $\kappa$ , immediately above the prism, looking directly downward at the drawing-paper and pencil, in the direction  $\kappa J$ , the sides  $D E$  and  $B C$  being parallel. The pencil point is, therefore, seen as clearly as it would be through a plain piece of glass.

The image from the microscope is received on the face  $F C$ , the stand being inclined at an angle of  $45^\circ$ . The rays, being totally reflected from the surface  $E F$ , are received on the face  $D G$  of the upper prism, which is separated from the lower prism by a thin film of air. From thence the rays pass to the eye, and the images of pencil, paper and object on the stage are received by the eye together.

When the light is properly adjusted this instrument leaves nothing to be desired; pencil, drawing and object are distinctly seen, and the light is easily managed. This instrument is manufactured by Messrs. Ross & Co., of London, and Mr. Walmsley some time ago told us he would soon have some of them in stock. The prism, as some readers will recognize, is the same as was first applied by Mr. Wenham as a binocular prism

for microscopes. Not many of those prisms were made for that purpose, however, probably owing to the difficulties of construction.

While commending this instrument in the highest terms, it is but fair to say that, owing to the considerable

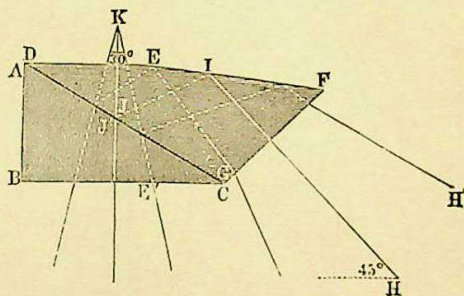


FIG. 29.—Schröder's Camera Lucida.

distance the light has to travel through it from the eye-lens, it can only be used with oculars of low power, having a long focus back of the eye-lens. Otherwise the rays come to a focus within the prism, or at least do not reach the point  $\kappa$  far enough above the prism to afford a sufficiently large field of view. This fact will greatly restrict the use of this otherwise most excellent camera lucida.

No such objection applies to the camera lucida of Grunow, which is the only one comparable with it. In fact, after showing the Schröder instrument to a well-known microscopist who was constantly using Grunow's form, he was quite unwilling to admit that either form was superior to the other as regards the clearness with which the image and pencil can be seen together.

359/447



## Electric Light for the Microscope.

An article upon this subject was promised some time ago, but in the

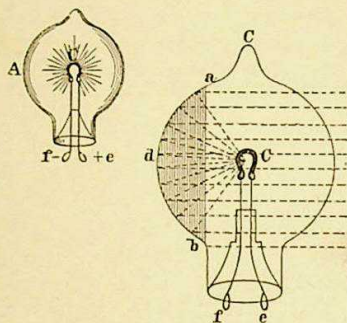


FIG. 30.—Incandescent Lamps.

hope of having an opportunity to test the qualities of the incandescent lamp in practical work we have deferred its publication until now. We are still unable to add any results from our own experience, but hope to supplement the present article with such observations before long. The cuts illustrating

this article have been copied from the *Zeitschrift für Mikroskopie*, where the apparatus is more fully described.

In Fig. 30 are represented the incandescent lamps as provided for this purpose by Müller, in Hamburg, of natural size, or only slightly reduced. In these the ordinary carbon filament is replaced by a spiral of platinum wire, which is heated to incandescence by the electric current. These lamps may be made of common glass, or, to modify the light, of opal glass. The manner of attaching the lamps to a microscope is shown in the elaborate arrangement in Fig. 31. The larger lamp serves for opaque objects, the smaller is beneath the stage. A system of wires passes beneath the microscope, which affords a means of regulating the strength of the current; but this part of the arrangement need not be described.

It is said that the current from two Bunsen or Grove cells of 20 cm. height, or two Grenet's cells, such as that shown in Fig. 33, will serve to light these lamps. We are not told, however, how long the necessary current will be sustained without changing the material in the cells.

The lamp may also be mounted on a separate support, such as is shown in Fig. 32.

One feature of the arrangement shown in Fig. 31 deserves especial notice. In the stage, beneath the object, there is a spiral of platinum (B), which becomes heated when the current is allowed to pass through it. The heating can be perfectly

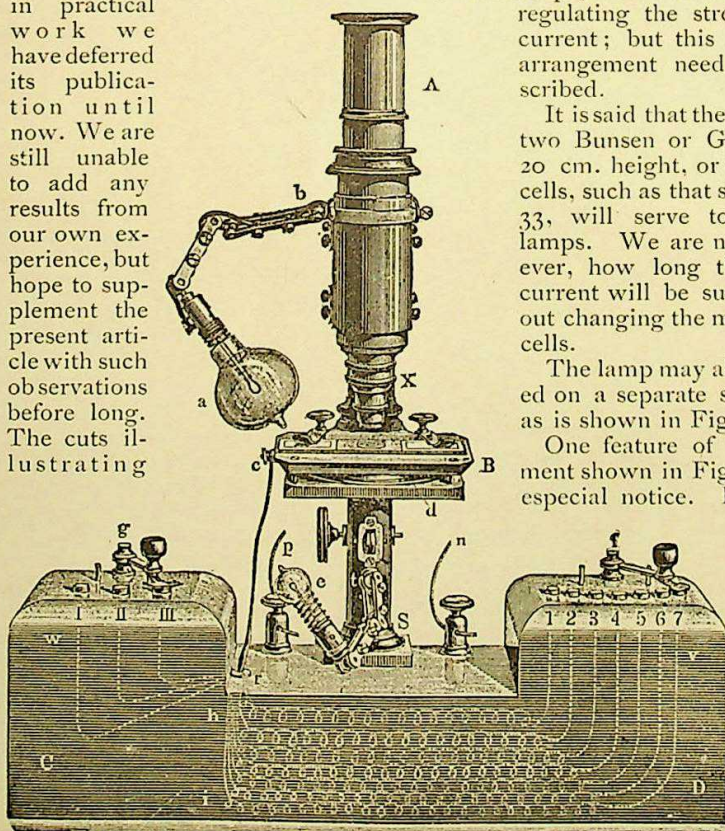


FIG. 31.—Microscope with Electric Light.